(updated: May 27, 2022)

Jeremy D. Brown

HAMR Lab, Johns Hopkins University
119 Hackerman Hall , 3400 N. Charles St., Baltimore, MD 21218
Phone: (410) 516-6609
Email: jdelainebrown@jhu.edu
Web: http://hamr.lcsr.jhu.edu
Citizenship: United States of America

Education

University of Michigan, Ann Arbor, Michigan

Ph.D., Mechanical Engineering, May 2014

- Dissertation Topic: Haptic Sensory Feedback for Improved Interface to Smart Prosthetics
- Advisor: R. Brent Gillespie

M.S.E., Mechanical Engineering: April 2012

B.S.E., Mechanical Engineering: Dual-Degree Engineering Program, December 2008 (Cum Laude)

Morehouse College, Atlanta, Georgia

B.S., Applied Physics: Dual-Degree Engineering Program, December 2008 (Magna Cum Laude)

Positions Held

John C. Malone Assistant Professor, Johns Hopkins University — January 2017-Present
Department of Mechanical Engineering

Assistant Research Professor, Johns Hopkins University — 2016
Department of Mechanical Engineering

Postdoctoral Research Fellow, University of Pennsylvania — 2014-2016
Department of Mechanical Engineering and Applied Mechanics, GRASP Laboratory (Haptics Group)
Advisor: Katherine J. Kuchenbecker, Ph.D

Graduate Research Assistant, University of Michigan — 2009-2014
Department of Mechanical Engineering, Haptix Laboratory
Advisor: R. Brent Gillespie, Ph.D

Research Interests

My research seeks to improve the interface between humans and engineered systems with a specific focus on medical applications. I combine methods from human perception, motor control, neurophysiology, biomechatronics, and haptics. As a result, my work crosses the boundary between engineering, biomechanics, medicine, and psychophysics. My lab's current research focuses on haptic feedback and advanced training platforms for robot-assisted minimally invasive surgery, haptic feedback for upper-extremity prostheses, sensory impairment and recovery post stroke, and fundamental haptic perception.

Selected Honors and Awards

NSF CAREER Award, 2022
Sloan Foundation Research Fellow, 2022
JHU WSE/SOM Research Retreat Lab Excellence Award, 2022
JHU PHutures Career Impact Award (nomination), 2021

JHU Whiting School of Engineering Williams H. Huggins Excellence in Teaching Award, 2021
Cell Mentor's list of "1000 Inspiring Black Scientist in America," 2021
Interdisciplinary Rehabilitation Engineering Research Career Development Program Scholar, 2020-present
University of Pennsylvania Postdoctoral Fellowship for Academic Diversity, 2014-2016
Ford Foundation Dissertation Fellowship Honorable Mention, 2013
Edward Alexander Bouchet National Honor Society, 2013
Best Student Paper Award, IEEE Haptics Symposium, 2012
University of Michigan Martin Luther King North Campus Spirit Award (Nomination), 2012
AGEP Imade M. Asemoto First Year Student Award, 2010
National Science Foundation Graduate Research Fellowship, 2010-2013
University of Michigan Rackham Merit Fellowship, 2009-2014
Department of Mechanical Engineering Transfer Student Award, 2008
Dual-Degree Engineering Program Most Outstanding Fifth Year Student Award, 2008
Pi Tau Sigma National Mechanical Engineering Honor Society, 2007
Beta Kappa Chi National Scientific Honor Society, 2006
University of Michigan College of Engineering Scholarship 2006-2008 *(partial-tuition)*
NASA Ronald E. McNair Scholarship 2003-2008 *(partial-tuition)*
Morehouse College Academic Scholarship 2003-2006 *(tuition, room, board)*

Student Honors and Awards

Sergio Machaca, Link Foundation Fellowship, 2022
Autumn Hughes, Fulbright Fellowship, 2022
Naveed Riaziat, NSF GRFP Fellowship (Honorable Mention), 2022
Autumn Hughes, Achievement Rewards for College Scientists (ARCS) Scholarship, 2021
Alexandra Miller, NSF GRFP Fellowship (Honorable Mention), 2021
Ihemriorocchi Amanze, Morgan State STEM Fair First Place (category), 2020
Autumn Hughes, JHU Provost Undergraduate Research Award (PURA), 2020
Mohit Singhala, George M.L. Sommerman Engineering Graduate Teaching Award, 2020
Amy Chi, James Bell Convocation Award, 2019
Sergio Machaca, NSF GRFP Fellowship, 2019
Mohit Singhala, Creel Family Teaching Assistant Award, 2019
Maya Sitaram, JHU Summer Provost Undergraduate Research Award, 2019
Neha Thomas, Fulbright Fellowship, 2019
Neha Thomas, DAAD Scholarship, 2019
Garrett Ung, Charles A. Miller Convocation Award, 2019
Neha Thomas, NSF GRFP Fellowship, 2018

Unpublished Papers (In Preparation and Under Review)

doctoral advisees, masters advisees, undergraduate advisees, high school advisees, senior author
† doctoral advisor, ‡ post-doctoral advisor

U1 Li K., **Brown J.D.**, Multi-Modality Haptic Feedback for Myoelectric Prostheses. *IEEE Transactions on Haptics* (in preparation)

U2 Caccianiga G., Cantarero G.L., Celnik P., Mooney R., **Brown J.D.**, Non-invasive Cerebellar Stimulation Enhances Training in Robot-assisted Surgery. *Brain Stimulation* (in preparation)

U3 Singhala M., **Brown. J.D.**, Mirror-Brush Illusion: Creating phantom tactile percepts on intact limbs. *Scientific Reports* (in preparation)

U4 Carducci J., Olds K., Krakauer J., Xu J., **Brown J.D.**, Novel Planar Strain Sensor for Capturing 3-Dimensional Fingertip Forces from Stroke Patients. *Sensors* (in preparation)

U5 Thomas N., Miller A.J., Ayaz H., **Brown J.D.**, Haptic Shared Control Improves Neural Efficiency During Myoelectric Prosthesis Use. *Scientific Reports* (under review)

U6 Singhala M., **Brown J.D.**, Understanding the impact of teleoperator transmission dynamics on operator task performance. IEEE/RSJ International Conference on Intelligent Robots andSystems (IROS) (under review)

U7 Khan M., Carducci J.D., Xu J., **Brown J.D.**, Design and Analysis of a Haptic Interface for Hand Dexterity Rehabilitation. *IEEE/RSJ International Conference on Intelligent Robots andSystems (IROS)* (under review)

U8 Riaziat N., Machaca S., Miller A.J., Onder E., **Brown J.D.**, Krieger A., Development and Evaluation of a Bilateral Position-Based Control System for Magnetically Actuated Microrobots. *IEEE/RSJ International Conference on Intelligent Robots andSystems (IROS)* (under review)

U9 Cao E., Machaca S., Chi A., Adrales G., ‡Kuchenbecker K.J., **Brown J.D.**, Wrist-Squeezing Force Feedback Reduces Applied Forces in Robotic Surgery Training. *IEEE Robotics and Automation Letters* (under second round review).

U10 Thomas N., Fazlollahi F., ‡Kuchenbecker K.J., **Brown J.D.**, A comparison of hybrid tactile-reflexive control schemes for upper-extremity prosthesis control in the absence of direct vision *IEEE Transactions on Neural Systems and Rehabilitation Engineering* (under revision following first round review).

U11 **Brown J.D.**, ‡Kuchenbecker K.J., Effects of Automated Skill Assessment on Robotic Surgery Training. *International Journal of Medical Robotics and Computer Assisted Surgery* (under revision following first round review)

Journal Publications

doctoral advisees, masters advisees, undergraduate advisees, high school advisees, senior author
† doctoral advisor, ‡ post-doctoral advisor

—— At JHU ——

J1 Rose C.G., Deshpande A.D., Carducci J., **Brown J.D.**, The road forward for upper extremity rehabilitation robotics. *Current Opinion in Biomedical Engineering*, vol. 19, 2021

J2 Thomas N., Ung G., Ayaz H., and **Brown J.D.**, "Neurophysiological Evaluation of Haptic Feedback for Myoelectric Prostheses," *IEEE Transactions on Human-Machine Systems*, vol. 51, no. 3, pp. 253-264, 2021

J3 Machaca S., Ung G., **Brown J.D.**, Towards an understanding of the utility of dual-modality haptic feedback in teleoperated medical devices. *IEEE Transactions on Medical Robotics and Bionics*, 2020;2(4):574-577

J4 Caccianiga G., Mariani A., DeMomi E., Cantarero G., **Brown J.D.**, An Evaluation of Inanimate and Virtual RealityTraining for Psychomotor Skill Development in Robot-Assisted Minimally Invasive Surgery, *IEEE Transactions on Medical Robotics and Bionics*, 2020;2(2):118-129

J5 Thomas N., Ung G., McGarvey C., **Brown J.D.**, Comparison of vibrotactile and joint-torque feedback in a myoelectric upper-limb prosthesis, *Journal of NeuroEngineering and Rehabilitation (Impact Factor = 3.87)*, 2019;16(1):70

—— Before JHU ——

J6 **Brown J.D.**, O'Brien C.E., Leung S.C., Dumon K.R., Lee D.I., ‡Kuchenbecker K.J., Using Contact Forces and Robot Arm Accelerations to Automatically Rate Surgeon Skill at Peg Transfer. *IEEE Transactions on Biomedical Engineering (Impact Factor = 2.347)*, 2017;64(9):2263-2275

J7 **Brown J.D.**, Shelley M., Gardner D., Gansallo E.A., †Gillespie R.B., Non-colocated Kinesthetic Display Limits Compliance Discrimination in the Absence of Terminal Force Cues. *IEEE Transactions on Haptics (Impact Factor = 1.87)*, 2016;9(3):387-96

J8 **Brown J.D.**, Kunz T., Gardner D., Shelley M.K., †Gillespie R.B., Davis A.J., An Empirical Evaluation of Force Feedback in Body-Powered Prostheses. *IEEE Transactions on Neural Systems and Rehabilitation Engineering (Impact Factor = 3.188)*, 2016;25(3):215-226

J9 **Brown J.D.**, Paek A., Syed M., O'Malley M.K., Shewokis P.A., Contreras-Vidal J.L., Davis A.J., †Gillespie R.B., An Exploration of Grip Force Regulation with a Low-Impedance Myoelectric Prosthesis Featuring Referred Haptic Feedback. *Journal of NeuroEngineering and Rehabilitation (Impact Factor = 2.74)*, 2015;12(1):04

Peer-Reviewed Conference Publications

doctoral advisees, masters advisees, undergraduate advisees, high school advisees, senior author
† doctoral advisor, ‡ post-doctoral advisor

—— At JHU ——

C1 Machaca S., Karachiwalla, Z., Riaziat N., Towards a ROS-based modular multi-modality haptic feedback system for robotic minimally invasive surgery training assessments. *2022 IEEE International Symposium on Medical Robotics* (Accepted)

C2 Singhala M., **Brown J.D.**. Towards an understanding of how handedness affects stiffness perception in active exploration. *2022 IEEE Haptics Symposium* (Accepted)

C3 Singhala M., **Brown J.D.**, A novel testbed for investigating the impact of teleoperator dynamics on perceived environment dynamics. *2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 8358-8364 (Virtual oral presentation by Singhala due to COVID-19)

C4 Thomas, N., Fazlollahi, F., **Brown, J.D.**, ‡Kuchenbecker, K.J., Sensorimotor-inspired Tactile Feedback and Control Improve Consistency of Prosthesis Manipulation in the Absence of Direct Vision. *2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 6174-6181 (Virtual oral presentation by Thomas due to COVID-19)

C5 Singhala M., **Brown J.D.** Prefatory study of the effects of exploration dynamics on stiffness perception. In *Proc. IEEE Haptics Symposium*, 128-133, 2020 (Virtual oral presentation by Singhala due to COVID-19)

C6 Miller E., Amanze I., **Brown J.D.**, A Wearable Anthropomorphically Driven ProsthesisWith a Built-In Haptic Feedback System. In *Proc. IEEE International Symposium on Medical Robotics*, 2020 (Virtual oral presentation by Miller due to COVID-19)

—— Before JHU ——

C5 **Brown, J.D.**, Fernandez, J.N., Cohen, S.P., ‡Kuchenbecker, K.J., A Wrist-Squeezing Force-Feedback System for Robotic Surgery Training. In *Proc. IEEE World Haptics Conference*, 2017 (Oral presentation given by Brown)

C6 **Brown, J.D.**, Ibrahim, M., Chase, E. D. Z., Pacchierotti, C., ‡Kuchenbecker, K.J., Data-driven comparison of four cutaneous displays for pinching palpation in robotic surgery. In *Proc. IEEE Haptics Symposium* 147154, 2016 (Oral presentation given by Brown)

C7 †Gillespie R.B., Suchoski J.M., Yu B., **Brown J.D.**, Kim D. Series Elasticity for Free Free-Space Motion for Free. In *Proc. IEEE Haptics Symposium*, 609-615, 2014 (Poster presentation given by Brown)

C8 Paek A., **Brown J.D.**, †Gillespie R.B., O'Malley M., Shewokis P., Contreras-Vidal J., Reconstructing Surface EMG from Scalp EEG During Myoelectric Control of a Closed Looped Prosthetic Device. In *Proc. IEEE Engineering in Medicine and Biology Society (EMBS) Conference*, 5602-5605, 2013 (Oral presentation given by Paek)

C9 **Brown J.D.**, Paek A., Syed M., O'Malley M.K., Shewokis P.A., Contreras-Vidal J.L., †Gillespie R.B., Understanding the Role of Haptic Feedback in a Teleoperated / Prosthetic Grasp and Lift Task. In *Proc. IEEE World Haptics Conference*, 271-276, 2013 (Oral presentation given by Gillespie)

C10 **Brown J.D.**, †Gillespie R.B., Gardner D., Gansallo E.A., Co-Location of Force and Action Improves Identification of Force-Displacement Features. In *Proc. IEEE Haptics Symposium*, 187-193, 2012. Oral presentation given by Brown (Awarded Best Student Paper)

C11 **Brown J.D.**, †Gillespie R.B., The Effect of Force/Motion Coupling on Motor and Cognitive Performance. In *Proc. IEEE World Haptics Conference*, 197-202, 2011 (Poster presentation given by Brown)

C12 †Gillespie R.B., Contreras-Vidal J.L., Shewokis P.A., O'Malley M.K., **Brown J.D.**, Agashe H., Gentili R., Davis A. Toward improved sensorimotor integration and learning using upper-limb prosthetic devices. In *Proc. IEEE Engineering in Medicine and Biology Society (EMBS) Conference*, 5077-5080, 2010 (Oral presentation given by Contreras-Vidal)

Short Peer-Reviewed Conference Articles and Abstracts

doctoral advisees, masters advisees, undergraduate advisees, high school advisees, senior author
† doctoral advisor ‡ post-doctoral advisor

—— At JHU ——

S1 Miller A.J., Bettelani G.C., Fani S., Bianchi M, **Brown J.D.**, On the Utility of Affective Feedback in Prosthesis Embodiment, 2021 IEEE World Haptics Conference (WHC), 2021, pp. 874-874 (Virtual poster presentation by Miller due to COVID-19)

S2 Miller A.J., Riaziat A.J., **Brown J.D.**, An Open-Source Ungrounded Hapkit for Educational Applications, 2021 IEEE World Haptics Conference (WHC), 2021, pp. 1155-1155 (Virtual poster presentation by Riaziat due to COVID-19)

S3 Shah K., Ravichandar S., **Brown J.D.**, Proposing a framework for evaluating haptic feedback as a modalityfor velocity guidance. In *Proc. IEEE Haptics Symposium Works in Progress Session*, 2020 (poster session cancelled due to COVID-19).

S4 Singhala M., Carducci J., **Brown J.D.**, Towards an understanding of how humans perceive stiffness during bimanual exploration. In *Proc. IEEE Haptics Symposium Works in Progress Session*, 2020 (poster session cancelled due to COVID-19)

S5 Singhala M., **Brown J.D.**, A novel teleoperator testbed to understand the effects of master-slavedynamics on embodiment and kinesthetic perception. In: *Proc. IEEE Haptics Symposium Works in Progress Session*, 2020 (poster session cancelled due to COVID-19)

S6 Thomas N., Ung G., Ayaz H., **Brown J.D.**, Haptic feedback in a myoelectric prosthesis: Task performance and neurophysiological cognitive load assessment, 2019. In *Proc. IEEE World Haptics Conference Works in Progress Session*, 2019 (Interactive poser presented by Thomas)

S7 Singhala M., **Brown J.D.**, Investigating the effects of exploration dynamics on stiffness perception. In *Proc. IEEE World Haptics Conference Works in Progress Session*, 2019 (Interactive poser presented by Singhala)

S8 Singhala M., Chi A., Coleman M., **Brown J.D.**, Preliminary investigation into how limb choice affects kinesthetic perception. In *Proc. IEEE World Haptics Conference Works in Progress Session*, 2019, (Interactive poser presented by Singhala)

S9 Caccianiga G., Mariani A., De Momi E., **Brown J.D.**, Virtual Reality Training in Robot-Assisted Surgery: a Novel Experimental Setup for Skill Transfer Evaluation. In *Proc. 12th Annual Hamlyn Symposium on Medical Robotics*; 89-90, 2019 (Oral presentation given by Caccianiga)

S10 Cao E., Machaca S., Bernard T., Wolfinger B., Patterson Z., Chi A., Adrales G.L., ‡Kuchenbecker K.J., **Brown J.D.**, Bimanual Wrist Squeezing Haptic Feedback Changes Speed-Force Tradeoff in Robotic Surgery Training. Accepted to Society of American Gastrointestinal and Endoscopic Surgeons Annual Meeting, 2019, (Poster presentation given by Cao)

S11 Thomas N., Carducci J., **Brown J.D.**, Towards a generalized experimental framework for comparing haptic feedback modalities in myoelectric upper-limb prostheses. In *Proc. IEEE Haptics Symposium Works in Progress Session*, 2018 (Poster presentation given by Thomas)

S12 Singhala M., **Brown J.D.**, Towards an understanding of the role operator limb dynamics plays in Haptic perception of Stiffness. In *Proc. IEEE Haptics Symposium Works in Progress Session*, 2018 (Poster presentation presented by Singhala)

—— Before JHU ——

S13 **Brown J.D.**, O'Brien C., Miyasaka K.W., Dumon K.R., Kuchenbecker K.J. Analysis of Instrument Vibrations and Contact Forces Caused by an Expert Robotic Surgeon Doing FRS Tasks. In *Proc. 8th Annual Hamlyn Symposium on Medical Robotics*, 75-77, 2015 (Poster presentation given by Brown)

Hands-On Demonstrations

doctoral advisees, masters advisees, undergraduate advisees, high school advisees, senior author
† doctoral advisor ‡ post-doctoral advisor

—— At JHU ——

D1 Miller E., Amanze I., **Brown J.D.**, A Demonstration of an Anthropomorphically-Driven Prosthesis Featuring Embedded Haptic Feedback. Hands-on demonstration to be presented at IEEE Haptics Symposium, 2020 (conference cancelled due to COVID-19)

D2 Machaca S., Ung G., **Brown J.D.**, Virtual Grasp-And-Hold Task Using Continuous Vibrotactile and Squeezing Cues. Hands-on demonstration to be presented at IEEE Haptics Symposium, 2020 (conference cancelled due to COVID-19)

—— Before JHU ——

D3 **Brown J.D.**, Ibrahim M., Chase E.D.Z., Pacchierotti C., ‡Kuchenbecker K.J., One sensor, three displays: A comparison of tactile rendering from a BioTac sensor. Hands-on demonstration presented at IEEE Haptics Symposium, 2016

Invited/Non-refereed/Short Conference Articles and Abstracts

doctoral advisees, masters advisees, undergraduate advisees, high school advisees, senior author
† doctoral advisor ‡ post-doctoral advisor

—— At JHU ——

I1 Khan M., George T., Carducci J., Ma T., Krakauer J., Xu J., **Brown J.D.**, Exploring the efficacy of cutaneous haptic feedback in post-stroke rehabilitation, International Conference on Rehabilitation Robotics (accepted), 2021 (Virtual poster presentation by Khan due to COVID-19)

I2 George T., Singhala M/, Casamento-Moran A, Nickl R, Pawar A, McMullen D, Cantarero G, **Brown J.D.**, Cortical mechanisms of sensorimotor attenuation in a SCI participant, The Society for Neuroscience Annual Meeting (accepted), 2021 (Virtual oral presentation by George due to COVID-19)

I3 Machaca S., Haupt R.M., Malpani A, **Brown J.D.**, Kinematic and kinetic task performance data for holistic assessment of skill at robot-assisted minimally invasive surgery *ACS Surgeons and Engineers: A Dialogue on Surgical Simulation meeting*, 2021

I4 Cao E., Machaca E., Chi A., Adrales G.L., ‡Kuchenbecker K.J., **Brown J.D.**,Bimanual Wrist-squeezing Haptic Feedback Changes Speed-force Tradeoff In Robotic Surgery Training. *ACS Surgeons and Engineers: A Dialogue on Surgical Simulation meeting*, 2021

I5 Xu J, Kumar S, Ma T, Olds K, **Brown J.D.**, Carducci J., Forrence A, Krakauer J.K., "Do we need finger individuation for precision grip?" The Society for Neuroscience Annual Meeting, Chicago 2019.

I6 Singhala M., **Brown J.D.**, Towards an Understanding of the Role Operator Limb Dynamics Plays in Haptic Perception of Stiffness.*Johns Hopkins University Malone Center for Engineering in Healthcare Symposium*, 2018 (Poster presented by Singhala)

I7 Thomas N., Ung G., McGarvey C., Carducci J., **Brown J.D.**, Comparison of Kinesthetic and Cutaneous Feedback in a Myoelectric Upper-Limb Prosthesis. *Johns Hopkins University Malone Center for Engineering in Healthcare Symposium*, 2018 (Poster presented by Brown)

I8 Cao E., Machaca S., Bernard T., Wolfinger B., Patterson Z., Chi A., Adrales G.L., ‡Kuchenbecker K.J., **Brown J.D.**, Bimanual Wrist-Squeezing Haptic Feedback Changes Speed-Force Tradeoff in Robotic Surgery Training. *Johns Hopkins University Malone Center for Engineering in Healthcare Symposium*, 2018 (Poster presented by Machaca)

—— Before JHU ——

I9 Paek A., **Brown J.D.**, †Gillespie B., O'Malley M., Shewokis P., Contreras-Vidal J., Reconstructing Electromyography from Electroencephalography during Myoelectric Control of a Closed Looped Prosthetic Device. *16th International Graphonomics Society Conference*, 2013

Invited Talks (Research)

—— At JHU ——

1. "Haptic Interaction Design for Human in the Loop Telerobotic Systems." Invited Lightening Talk, Google Robotics, virtual, April 23, 2022
2. "Haptic Feedback in Upper-Extremity Prostheses." Invited presentation, Johns Hopkins Medicine Limb Loss Symposium, virtual, April 26, 2022
3. "Haptic Augmentation of Medical Telerobotic Systems." Invited presentation, IEEE International Symposium on Medical Robotics Workshop - The Holistic Forum of Medical Robotic Junior Professors: From Rehabilitation to Surgical Robots, Atlanta, GA April 13, 2022
4. "Technology Based Augmentation in Robotic Surgery Training." Invited presentation, IEEE International Symposium on Medical Robotics Workshop - Diversity in Surgical Robotics Training, Atlanta, GA, April 13, 2022
5. "Haptics and Medical Robotics Laboratory." Invited presentation, JHU WSE/SOM Research Retreat Lab Excellence Award Presentation, Baltimore, MD, March 18, 2022
6. "Haptic Interaction Design for Telerobot Devices." Invited presentation, Quanser Inc. Youser Webinar, virtual, September 30, 2021
7. "Engineering Better Robotic Interfaces for Physical Medicine and Rehabilitation." Invited presentation, Johns Hopkins Medicine Department of Physical Medicine and Rehabilitation Grand Rounds, virtual, January 19, 2021
8. "Understanding the Utility of Haptic Feedback in Telerobotic Devices." Invited presentation, University of Pennsylvania KodLab, virtual, November 24, 2020
9. "Understanding the Utility of Haptic Feedback in Telerobotic Devices." Medtronic Corporation, virtual presentation, November 13, 2020
10. "Haptic Interaction Design for Human Robot Interaction." Invited Presentation, Workshop on Introduction to Next Generation Haptics for XR, IEEE International Conference on Intelligent Robots and Systems, virtual, October 29, 2020
11. "Haptic Feedback as a Means of Improving Dexterous Manipulation in Robot-Assisted Minimally Invasive Surgery and Upper-Limp Prosthetics." Invited Presentation, Workshop on Intelligent Human Augmentation in Medical Robotic Systems, IEEE International Symposium on Medical Robotics, Atlanta, GA, (postponed until November 17, 2021)
12. "Understanding the Utility of Haptic Feedback in Telerobotic Devices." University of Maryland Robotics Center seminar, College Park, MD, February 7, 2020
13. "Getting a Feel for Robotic Surgery: The Role of Haptic Cues in Early Psychomotor Skill Development." University of Chicago URobotics Symposium hosted by Dept. of Neurosurgery, Chicago, IL, May 22, 2019

14. "Understanding the Utility of Haptic Feedback in Human Robot Interaction." Johns Hopkins Zanvyl Krieger Mind/Brain Institute, Baltimore, MD, March 12, 2018
15. "Understanding the Utility of Haptic Feedback in Human Robot Interaction." GEM-ASEE Doctoral Showcase, Washington, DC, January 23, 2018
16. "Getting a Feel for Robotic Surgery: The Role of Haptic Cues in Early Psychomotor Skill Development." Clinical Robotic Surgery Association, Chicago, IL, September 23, 2017
17. "Improving Dextrous Manipulation with Telerobots." LCSR Industry Day, Johns Hopkins University, Baltimore, MD, March 22, 2017

—— Before JHU ——

13. "Smart Haptic Displays for Dextrous Manipulation of Telerobots." Johns Hopkins University, Baltimore, MD, March 9, 2016
14. "Smart Haptic Displays for Dextrous Manipulation of Telerobots." Georgia Institute of Technology, Atlanta, GA, February 25, 2016
15. "Smart Haptic Displays for Dextrous Manipulation of Telerobots." Carnegie Mellon University, Pittsburgh, PA, February 23, 2016
16. "Smart Haptic Displays for Dextrous Manipulation of Telerobots." Duke University, February 19, 2016
17. "Smart Haptic Displays for Dextrous Manipulation of Telerobots." University of Pennsylvania, Philadelphia, PA, February 16, 2016
18. "Comparison of Cutaneous Feedback Methods for Pinching Palpation in Robotic Surgery." Intuitive Surgical, Sunnyvale, CA, January 8, 2015
19. "The Role of Haptic Feedback in a Teleoperated Grasp and Lift Task." NSF Michigan Alliance for Graduate Education and Professoriate (AGEP) Symposium, Ann Arbor, MI, April 6, 2013 (*oral presentation*)
20. "Development of Haptic Sensory Feedback System for an Upper-Limb Prosthetic Gripper." Rehabilitation Institute of Chicago, Prothesis Design & Control Lab, April 13, 2012 (*invited talk*)
21. "Sensory Feedback for Neuroprosthetic Devices." University of Michigan Engineering Graduate Symposium, Ann Arbor, MI, November 12, 2010 (*poster presentation*)
22. "Sensory Substitution and Neuroprosthetics." NSF Michigan Alliance for Graduate Education and Professoriate (AGEP) Symposium, Ann Arbor, MI, April 10, 2010.(*oral presentation*)
23. "Sensory Feedback for Neuroprosthetic Devices." NSF Michigan Alliance for Graduate Education and Professoriate (AGEP) Symposium, Ann Arbor, MI, August 11, 2009 (*oral presentation*)

Invited Talks (Professional)

—— At JHU ——

1. Penn State University Millennium Scholars Program Summer Bridge Research Symposium Keynote Speaker, (virtual), July 15, 2021
2. Johns Hopkins University Explore Hopkins (EHop) Keynote Speaker, Baltimore, MD, October 5, 2018

—— Before JHU ——

3. University of Michigan Graduate School Visit Brunch Alumni Speaker, Ann Arbor, MI, March 10, 2018

Educational Presentations and Workshops

Technical Lectures for Students, Alumni, Parents, and Other Groups

1. "Haptic Technology: Engineering Your Sense of Touch." Lecturing and hands-on demonstration, Engineering Innovations Program, Johns Hopkins University, July 17, 2018

Educational Lectures and Outreach Activities

1. "Graduate School Workshop." Presenter, workshop for summer REU students participating in the LCSR NSF REU Program, Johns Hopkins University, July 16, 2021
2. "Graduate School Workshop." Presenter, workshop for summer REU students participating in the LCSR NSF REU Program, Johns Hopkins University, July 6, 2020
3. "Graduate School Workshop." Presenter, workshop for summer REU students participating in the LCSR NSF REU Program, Johns Hopkins University, July 26, 2018
4. "Graduate School Workshop." Presenter, workshop for summer REU students participating in the LCSR NSF REU Program, Johns Hopkins University, July 16, 2017

Media Highlights

November 2021 JoAnna Novak published a guest essay in the New York times that mentioned Prof. Brown's research on haptic feedback for prosthetics: *We're Longing for the One Thing the Metaverse Can't Give Us*, https://tinyurl.com/5n7hu585

September 2021 Scripps news company wrote an online news story on Prof. Brown's research on haptic feedback for prosthetics that was published on multiple news outlets including WMAR Baltimore (local ABC station): *Lab testing haptics device in prosthetic hands to help users with grip*, https://tinyurl.com/v2rc95kx

May 2021 The Orthotics and Prosthetics Almanac magazine published an article an article on Prof. Brown's research published in the IEEE Transactions on Human Machine Systems: *Researchers Study Benefit of Prostheses Integrated with Haptic Sensory Feedback*, May 2021 Issue, Pg. 12, https://tinyurl.com/ycyjdrdn

April 2021 Science News published an online article on the science of touch that featured an interview with Prof. Brown: *Capturing the sense of touch could upgrade prosthetics and our digital lives*, https://tinyurl.com/2p8dtn94

April 2021 Johns Hopkins HUB news outlet published an online article on Prof. Brown's research published in the IEEE Transactions on Human Machine Systems: *Get a grip: Adding haptics to prosthetic hands eases users' mental load*, https://tinyurl.com/ycksc5p2

April 2021 The Orthotics and Prosthetics Edge magazine published an online article on Prof. Brown's research published in the IEEE Transactions on Human Machine Systems: *Haptic Prosthesis Decreases Mental Load*, https://tinyurl.com/mrwzscjx

May 2021 NPR published an interview on the program All Things Considered that featured Prof. Brown providing insights and opinions on a manuscript published in the journal Science: *New Brain-Controlled Robotic Arm Gives Wearer The Sense Of Touch*, https://tinyurl.com/yckn3ewb

December 2020 Cell Mentor published an online article featuring Prof. Brown in the list: *1000 Inspiring Black Scientist in America*, https://tinyurl.com/5ytxera7

Research Advising (At JHU)

Doctoral and Pre-Doctoral Students

1. Lorena Velasquez, Ph.D. student, Johns Hopkins Mechanical Engineering, 2021 -
2. Alexandra Miller, Ph.D. student, Johns Hopkins Mechanical Engineering, 2020 - **DQE passed, 2022**

3. Naveed Riaziat, Ph.D. student, Johns Hopkins Mechanical Engineering, 2020 -
   DQE passed, 2021
4. Sergio Machaca, Ph.D. student, Johns Hopkins Mechanical Engineering, 2018 -
   DQE passed, 2019
5. Jacob Carducci, Ph.D. student, Johns Hopkins University, 2018 -
   DQE passed, 2019
6. Mohit Singhala, Ph.D. student, Johns Hopkins Mechanical Engineering, 2017 -
   DQE passed, 2019
   GBO passed, 2020
   Dissertation defended, April 2022
7. Neha Thomas, Ph.D. student Johns Hopkins Biomedical Engineering, 2017 -
   GBO passed, 2019
   Dissertation defended, March 2022
8. Bart Paulhamus, D.Eng student (co-advised with Chien-Ming Huang), Johns Hopkins University, 2018 - 2021

Masters Thesis/Research Students

1. Mohid Khan, M.S.E in Robotics, Johns Hopkins University, 2022
2. Teresa George, M.S. in Biomedical Engineering (co-advised with Gabriela Cantarero), Johns Hopkins University, 2021
3. Garrett Ung, M.S. in Mechanical Engineering, Johns Hopkins University, 2020
4. Ethan Miller, M.S. Biomedical Engineering, Johns Hopkins University, 2020
5. Guido Caccianiga, M.S. in Mechanical Engineering, Polytechnico de Milano, 2019
6. Darshini Balamurugan, M.S.E. in Robotics (co-advised with Nitish Thakor), Johns Hopkins University, 2019
7. Jacob Carducci, M.S.E. in Robotics, Johns Hopkins University, 2018

Undergraduate Students

1. Sithmi Jayasundara, B.S. in Biomedical Engineering, Johns Hopkins University, 2022-present
2. Chase Lahr, B.S. in Mechanical Engineering, Johns Hopkins University, 2021-present (sponsored through REU supplement to NSF award)
3. Anirejuoritse Egbe, B.S. in Electrical Engineering, Johns Hopkins University, 2021-present (sponsored through LCSR REU)
4. Zulekha Karachiwalla, B.S. in Computer Engineering, University of Maryland Baltimore County, 2021-present (sponsored through LCSR REU)
5. Harrison Menkes, B.S. in Mechanical Engineering, University of Michigan, 2021 (sponsored through REU supplement to NSF award)
6. Mohid Kahn, B.S. in Mechanical Engineering, Johns Hopkins University, 2020-2021 (ssponsored through REU supplement to NSF award)
7. Disha Mishra, B.S. in Biomedical Engineering, Johns Hopkins University, 2020 (sponsored through REU supplement to NSF award)
8. Maya Sitaram, B.S. in Mechanical Engineering, Johns Hopkins University, 2019-present
9. Autumn Hughes, B.S. in Biomedical Engineering, Johns Hopkins University, 2019-present
10. Willa Grinsfelder, B.S. in Mechanical Engineering, Johns Hopkins University, 2019-2020
11. Rachel Haupt, B.S. in Biomedical Engineering, University of South Carolina, Summer 2019 (sponsored through LCSR REU)

12. Joshua Burnell, B.S. in Mechanical Engineering, North Carolina A&T University, Summer 2019 (sponsored through LCSR REU)
13. Carlos Souffrain, B.S. in Computer Engineering, University of Maryland Baltimore County, Summer 2019 (sponsored through Leadership Alliance Consortium)
14. Aiden Devaney, B.S. in Physics, Goucher College, Summer 2019
15. Amy Chi, B.S. in Mechanical Engineering, Johns Hopkins University, 2018-2019
16. Eric Cao, B.S. in Biomedical Engineering, Johns Hopkins University, 2018-present
17. Brett Wolfinger, B.S. in Biomedical Engineering, Johns Hopkins University, 2017-2018
18. Garrett Ung, B.S. in Mechanical Engineering, Johns Hopkins University, 2018-2019
19. Nathaniel Olsen, B.S. in Biomedical Engineering, University of Utah, Summer 2018 (sponsored through REU supplement to NSF award)
20. Colette McGarvey, B.S. in Biomedical Engineering, Tulane University, Summer 2018 (sponsored through LCSR REU)
21. Timothy Bernard, B.S. in Mechanical Engineering, University of Maryland Baltimore County, Summer 2018 (sponsored through Leadership Alliance Consortium)
22. Zachary Patterson, B.S. in Mechanical Engineering, University of Pittsburgh, Summer 2017 (sponsored through LCSR REU)
23. Christopher Scherz, B.S. in Mechanical Engineering, Johns Hopkins University, 2017

High School Research Students

1. R'Reeyah Mabry Francis, Baltimore Ingenuity Project, 2021-present
2. Ihemriorochi Amnanze, Baltimore Ingenuity Project, 2019-2020 (sponsored through Ingenuity Project)
3. Niya Grier, Garrison Forest School, 2018-2019 (sponsored through JHU WISE Program)
4. Catherine Robbins, The Park School, 2018
5. Eryk-Amon Goode, 2018

Grants and Contracts

Current

1. Faculty Early Career Development Program (CAREER)
   CAREER: Dexterous Prosthesis Manipulation through Context-Driven Amputee–Prosthesis Co-Adaptation
   Investigators: Jeremy D. Brown (PI)
   Agency: National Science Foundation
   Funding: $730,255
   Dates: July 1, 2022 - June 30, 2027

2. Intuitive Surgical Technology Research Grant
   Control Arbitration for Robot-Assisted Minimally Invasive Surgery Utilizing a Skill-Based Shared-Control Framework
   Investigators: Jeremy D. Brown (PI), Axel Krieger (Co-I)
   Agency: Intuitive Surgical
   Funding: $50,000
   Dates: January 1, 2022 - December 31, 2023

3. JHU Malone Center for Engineering in Healthcare Seed Grant
   Skill Based Control Arbitration for Robot-Assisted Minimally Invasive Surgery
   Investigators: Jeremy D. Brown (PI) and Axel Krieger (Co-I)
   Agency: Johns Hopkins University
   Funding: $50,000
   Dates: October 1, 2021 - September 30, 2023

4. Interdisciplinary Rehabilitation Engineering Research Career Development Program
   Assessing Proprioceptive Impairment and its Impact on Motor Control Post Stroke
   Investigators: Jeremy D. Brown (Scholar)
   Agency: Northwestern University funded by NIH K12HD073945
   Funding: $100,000 (salary) + $25,000 (research)
   Dates: September 1, 2020 - August 31, 2021 (NCE pending)

5. NSF CISE Small #IIS-1910939
   Understanding Environment Perception and Task Performance in Human-in-the-Loop Tele-robotic Systems (HiLTS)
   Investigators: Jeremy D. Brown (PI)
   Agency: National Science Foundation
   Funding: $496,739
   Dates: October 1, 2019 - September 30, 2022

6. NSF CISE REU Extension to #IIS-1910939
   Funding: $16,000
   Dates: 5/1/2021 - 4/30/2022

Complete

1. NSF CISE REU Extension to #IIS-1910939
   Funding: $16,000
   Dates: 5/1/2020 - 4/30/2021

2. NSF CISE CRII #IIS-1657245
   Improving Dexterous Manipulation with Telerobots Through Operator-Sensitive Haptic Display
   Investigators: Jeremy D. Brown (PI)
   Agency: National Science Foundation
   Funding: $174,991
   Dates: August 1, 2017 - July 31, 2021

3. NSF CISE REU Extension to #IIS-1657245
   Funding: $16,000
   Dates: 5/1/2020 - 4/30/2021

4. NSF CISE REU Extension to #IIS-1657245
   Funding: $16,000
   Dates: 6/1/2019 - 5/31/2020

5. NSF CISE REU Extension to #IIS-1657245
   Funding: $16,000
   Dates: 5/1/2018 - 4/30/2019

6. Intuitive Surgical Technology Research Grant
   Comparison of Cutaneous Feedback Methods for Pinching Palpation in Robotic Surgery
   Investigators: Katherine J. Kuchenbecker (PI), Jeremy D. Brown (Co-I)

Agency: Intuitive Surgical, Inc.
Funding: $50,000
Dates: January 1, 2015 - December 31, 2015

Instruction and Curriculum Development

Johns Hopkins University 2017-present

EN.530.421: Mechatronics
Semesters taught (enrollment): Spring 2019 (34), 2020 (34)
Course description: This course provides students of various engineering backgrounds with a hands-on practicum in mechatronic system design. Topics include passive/active circuits sensors, actuators, state machines, and closed-loop feedback control.

EN.530.691: Haptic Interface Design for Human–Robot Interaction (developed course)
Semesters taught (enrollment): Fall 2017 (14), 2018 (23), 2019 (34), 2020 (23), 2021 (34)
Course description: This course provides an introduction to haptic interface design and analysis for human-robot interaction involving virtual environments, augmented reality, and teleoperation. Topics include human touch perception, haptic-focused mechatronic design, system modeling and analysis (kinematic and dynamic), human-in-the-loop feedback control, and haptic feedback evaluation.
Highlight: Two course projects have been submitted to international haptics conferences in the Works in Progress Session (both accepted).

Professional Activities

Advisory Committees

Advisory Board, Future Leaders in Mechanical and Aerospace Engineering Seminar Series (2020-present)

Editorships

Associate Editor, IEEE Robotics and Automation Letters (2018-present)

Journal Reviews

Science Robotics, IEEE Transactions on Haptics, IEEE Transactions on Mechatronics, IEEE Transactions on Human-Machine Systems, IEEE Transactions on Medical Robotics and Bionics ACM Transactions on Human Robot Interaction

Conference Organization Committees

2022 IEEE Haptics Symposium (Santa Barbara, CA)
2021 IEEE World Haptics Conference (virtual due to COVID-19)
2020 IEEE Haptics Symposium (virtual due to COVID-19)
2018 IEEE Haptics Symposium (San Francisco, CA 2019)
2016 IEEE Haptics Symposium (Philadelphia, PA)

Grant Reviews

NSF Panelist - Engineering Directorate (2021, 2020)
NSF Panelist - CISE Directorate (2017, 2018)
NIH Ad hoc Panelist - MRS Study Section (2022)

Professional Affiliations

Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)
Institute of Electrical and Electronics Engineers, Robotics and Automation Society (IEEE)

American Society of Mechanical Engineers (ASME)
National Society of Black Engineers (NSBE)

Service and Outreach

University Service, Johns Hopkins University

Diverse Names and Narratives Task Force (2021-present)
Homewood Council for Inclusive excellence (2019-2021)
Institute for Assured Autonomy Director search committee (2019-2020)
Laboratory for Computational Sensing and Robotics Assistant Research Engineering Search Committee (2019)
WSE/DOM Research Retreat Planning Committee (2018-2019)
Malone Center for Engineering in Healthcare Symposium Planning Committee (2017)

Department Service, Johns Hopkins University

Dept. of Mechanical Engineering Diversity and Inclusion Commitee (2020-present)
Dept. of Mechanical Engineering Graduate Curriculum Committee (2018-present)
Dept. of Mechanical Engineering Junior Faculty Undergrauate Curriculum Committee (2018-2019)
Dept. of Mechanical Engineering Grad Visit Day URM/Women Lunch Committee (2018-present)

Baltimore Community Service

Faculty Mentor, Baltimore Ingenuity Projet (2019-present)
Faculty Mentor, JHU Women in Science and Engineering Program (2017-2018)
Faculty Mentor, The Park School of Baltimore Senior Internship (2018)

Ad Hoc University Service

Reader, WSE Order of the Engineering Induction Ceremony (May 2022)

Ad Hoc Diversity and Inclusion Service

Speaker/Organizer, JHU Scott Bates Tower Dedication Ceremony (January 2022-present)
Panelist, JHU Vivian Thomas Scholars Initiative (student visit) (May 2022)
Review Committee, JHU WSE Excellence in Teaching Awards Committee (February-March 2022)
Panelist, JHU Vivian Thomas Scholars Initiative Virtual Visit Day Panel (January 2022)
Panelist, JHU Discover Series Diversity and Inclusion Panel (December 2021)
Panelist, Explore Hopkins graduate recruitment program (November 2021)
Interviewee, Baltimore Online Algebra for Students in Technology (BOAST) Program, (July 2021)
Host, Future Leaders in Mechanical and Aerospace Engineering Seminar (April 2021)
Moderator, Hopkins Engineering GradPath Collaborative Panel (March 2021)
Co-organizer, Hopkins Mechanical Engineering URM Graduate School Open House (December 2020)
Panelist, Hopkins Discover Series Diversity and Inclusion Panel (December 2020)
Panelist, Explore Hopkins graduate recruitment program (November 2020)
Participant, Black/LatinX Student Welcome Event (September2020)
Member, Mechanical Engineering Diversity and Inclusion Statement Working Group (Summer 2020)
Presenter, JHU SABES Program "Meet the Scientist" series (June 2020)
Panelist, Ingenuity Project Men's Breakfast (January 2020)

Professional Development

(NSF sponsored) Minority Faculty Development Workshop (Participant)
Harvard University — September 2019

Academic and Research Leadership Network Symposium (Participant)
Academic and Research Leadership Network — April 2017

Academic and Research Leadership Network Symposium (Participant)
Academic and Research Leadership Network — April 2015

Building Future Faculty Program (Participant)
North Carolina State University — April 2015

FOCUS Fellows Program (Participant)
Georgia Institute of Technology — January 2014

NextProf Future Faculty Workshop (Participant and Invited Guest Speaker)
University of Michigan — September 2012

Academy for Future Science Faculty (Member)
Northwestern University — June 2012-Present

Project Management Workshop (Participant)
Michigan Alliance for Graduate Education and the Professoriate — March 2012

Minority Faculty/Student Mixer (Organizer and Participant)
Society of Minority Engineers and Scientists Graduate Component — October 2011

Compact for Faculty Diversity Workshop (Participant)
Southern Regional Education Board — September 2011

Professional Skills for Research Scientists Course (Student)
University of Michigan Department of Kinesiology — January-April 2010